IN THE CLAIMS

Please amend the claims as follows:

Claims 1-18 (Canceled).

19. (New) A radial vane for a toothbrush, comprising:

a disk-shape portion;

a through hole formed at a center part of the disk-shaped portion, through which a tip portion of a handle of the toothbrush penetrates;

a weld portion in an annular shape provide around the through hole; and

a plurality of bristle members extending outward from the weld portion in a radial direction of the disk-shape.

20. (New) The radial vane for a toothbrush according to claim 19, wherein the weld portion includes a first and second surface and a protrusion is formed on at least one of the first and second surfaces.

21. (New) The radial vane for a toothbrush according to claim 20, wherein the protrusion is an annular protrusion continuing in a circumferential direction.

22. (New) The radial vane for a toothbrush according to claim 20, wherein the protrusion is formed as a group of protrusions formed interspatially along a circumferential direction.

23. (New) The radial vane for a toothbrush according to claim 19, wherein the plurality of bristle members, extending outward from the annular weld portion in the radial

direction of the disk shape, constitute a brush portion where long bristle members and short bristle members are mixed.

24. (New) The radial vane for the toothbrush according to claim 19, wherein the plurality of bristle members, extending outward from the annular weld portion in the radial direction of the disk shape, constitute a brush portion where bristle members having a large diameter and bristle members having a small diameter are mixed.

25. (New) A 360-degree toothbrush comprising:

a handle; and

a radial brush head in a cylindrical shape, constituted by superposing a plurality of radial vanes according to claim 19, at a tip portion of the handle of the toothbrush.

26. (New) The 360-degree toothbrush according to claim 25, wherein the weld portion includes a first and second surface and a protrusion is formed on at least one of the first and second surfaces.

27. (New) The 360-degree toothbrush according to claim 26, wherein the protrusion is an annular protrusion continuing in a circumferential direction.

28. (New) The 360-degree toothbrush according to claim 26, wherein the protrusion is formed as a group of protrusions formed interspatially along a circumferential direction.

29. (New) The 360-degree toothbrush according to claim 25, wherein the plurality of radial vanes that constitute the radial brush head include at least one hard radial vane having bristles of a large diameter and at least one soft radial vane having bristles of a small diameter mixed therein.

30. (New) The 360-degree toothbrush according to claim 25, wherein the plurality of radial vanes that constitute the radial brush head include at least one radial vane of a large diameter having a long bristle length at a brush portion and at least one radial vane of a small diameter having a short bristle length at the brush portion mixed therein.

31. (New) A method of manufacturing a radial vane for a toothbrush, the method comprising:

feeding a bristle bundle formed by bundling a plurality of bristle members to penetrate from a back face side to a surface side of a processing bed to be exposed on the processing bed by a predetermined length:

opening radially an exposed part of the bristle bundle on the surface of the processing bed to a periphery;

welding a center part of the bristle bundle opened radially in an annular shape; and removing an inside of the weld portion in the annular shape.

32. (New) The method of manufacturing a radial vane according to claim 31, further comprising in the welding step, when the center of the bristle bundle opened radially is welded in the annular shape, a protrusion is formed at the same time on a surface of the weld portion.

33. (New) A method of manufacturing a radial vane for a toothbrush, the method comprising:

feeding a bristle bundle formed by bundling a plurality of bristle members to penetrate from a back face side to a surface side of a processing bed to be exposed on the processing bed by a predetermined length:

opening an exposed part of the bristle bundle radially on the surface of the processing bed to a periphery; and

welding a center part of the bristle bundle opened radially by pressing the bristle bundle against the processing bed by a welding head in a cylindrical shape also serving as a punch so as to be welded in an annular shape, and at the same time, removing an inside of the weld portion in the annular shape.

34. (New) The method of manufacturing the radial vane for a toothbrush according to claim 33, wherein an annular blade is provided around a through hole of the processing bed, and the inside of the weld portion in the annular shape is removed by the annular blade and by an inner peripheral part of the welding head.

35. (New) The method of manufacturing the radial vane for a toothbrush according to claim 33, further comprising:

providing an annular recessed part or a plurality of recessed parts arranged interspatially in a peripheral direction around a through hole of the processing bed; and

welding the center part of the bristle bundle opened radially in an annular shape, and at the same time, forming a protrusion on a surface of the weld portion.

36. (New) An apparatus for manufacturing a radial vane for a toothbrush, comprising:

feeding means for exposing a bristle bundle, formed by bundling a plurality of bristle members and caused to penetrate from a back face side to a surface side of a recessing bed, on the processing bed by a predetermined length;

opening means for opening for opening an exposed part of the bristle bundle radially on the surface of the processing bed to a periphery;

welding means for welding a center part of the bristle bundle, opened radially, in an annular shape; and

removing means for removing an inside of the weld portion in the annular shape, wherein

a recessed part formed in an annular shape or a plurality of recessed parts formed interspatially in a peripheral direction are provided around a through hole of the processing bed such that a melting material is flowed therein when welding.

37. (New) An apparatus for manufacturing a radial vane for a toothbrush, comprising:

feeding means for causing a bristle bundle formed by bundling a plurality of bristle members to penetrate from a back face side to a surface side of a processing bed and exposing it on the processing bed by a predetermined length;

opening means for opening an exposed part of the bristle bundle radially on the surface of the processing bed to a periphery; and

welding and removing means for pressing a center part of the bristle bundle opened radially against the processing bed by a welding head in a cylindrical shape also

serving as a punch so as to weld it in an annular shape, and at the same time, removing an inside of the weld portion in an annular shape.

38. (New) The apparatus for manufacturing a radial vane for a toothbrush according to claim 37, further comprising:

an annular blade, provided around a through hole of the processing bed, for removing an inside of the weld portion in the annular shape in cooperation with the welding head.

39. (New) The apparatus for manufacturing the radial vane for the toothbrush according to claim 37, further comprising:

recessed part formed in an annular shape or a plurality of recessed parts arranged interspatially in a peripheral direction, provided around a through hole of the processing bed, such that a melting material is flowed therein when welding.

40. (New) The apparatus for manufacturing the radial vane for the toothbrush according to claim 37, wherein the welding head also serves as the opening means.

41. (New) The apparatus for manufacturing the radial vane for the toothbrush according to claim 40, wherein the welding head has an exhaust hole for exhausting air at a center part thereof, and is capable of moving up and down, and with exhaust air, presses the bristle bundled opened to a periphery against the processing bed so as to fix it radially.